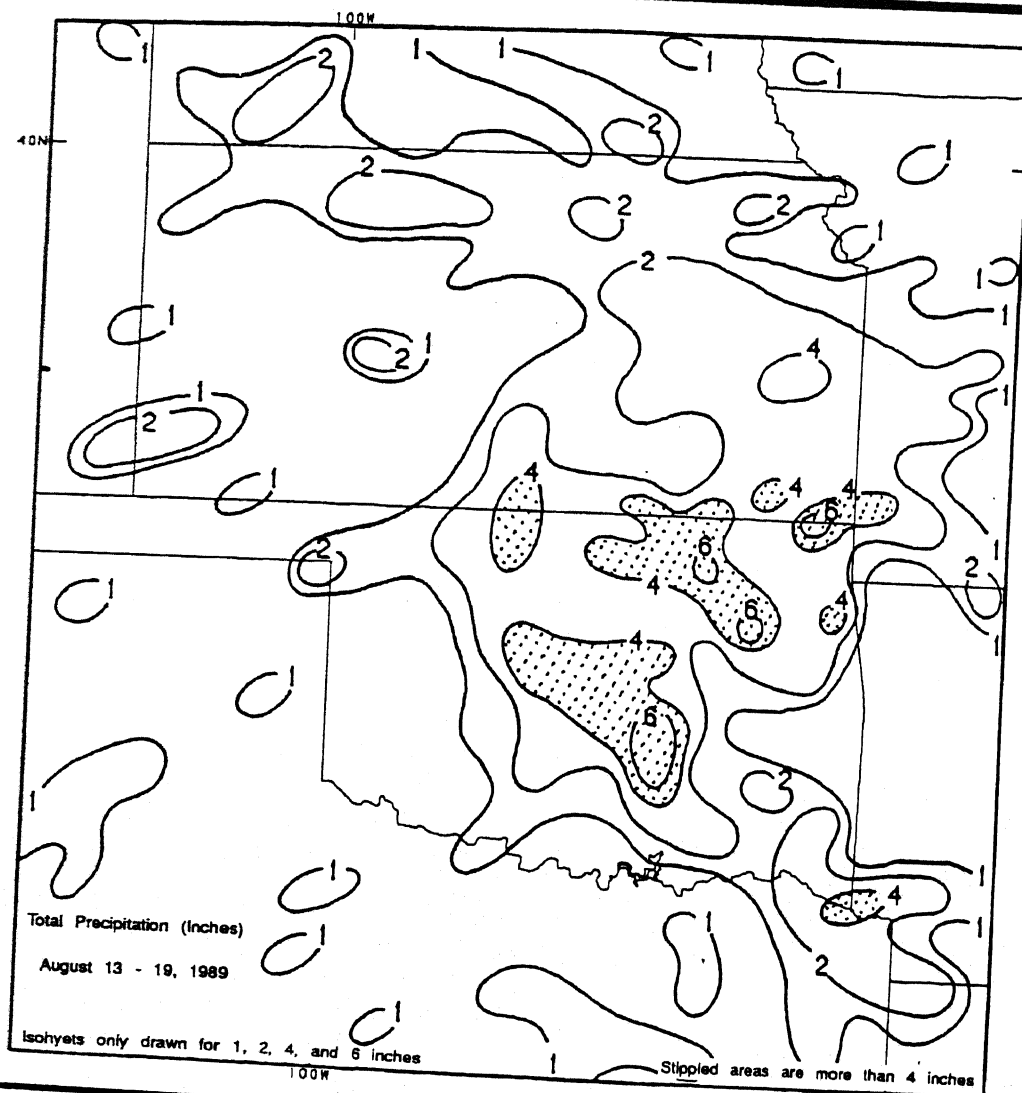


# WEEKLY CLIMATE BULLETIN

No. 89/33

Washington, DC

August 19, 1989



AFTER A BRIEF RESPITE FROM WET WEATHER, MUCH OF THE SOUTH-CENTRAL GREAT PLAINS WERE DRENCHED WITH UP TO 9.1 INCHES OF RAIN THAT CAUSED SOME FLOODING. LAST WEEK'S HEAVY RAINS CONTINUED A PATTERN OF ABOVE NORMAL PRECIPITATION IN THE REGION SINCE THE LATE SPRING.

UNITED STATES DEPARTMENT OF COMMERCE  
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION  
NATIONAL WEATHER SERVICE - NATIONAL METEOROLOGICAL CENTER  
CLIMATE ANALYSIS CENTER

# WEEKLY CLIMATE BULLETIN

This Bulletin is issued weekly by the Climate Analysis Center and is designed to indicate, in a brief **concise** format, current surface climatic conditions in the United States and around the world. The Bulletin contains:

- Highlights of major climatic events and anomalies.
- U.S. climatic conditions for the previous week.
- U.S. apparent temperatures (summer) or wind chill (winter).
- U.S. cooling degree days (summer) or heating degree days (winter).
- Global two-week temperature anomalies.
- Global four-week precipitation anomalies.
- Global monthly temperature and precipitation anomalies.
- Global three-month precipitation anomalies (once a month).
- Global twelve-month precipitation anomalies (every three months).
- Global three-month temperature anomalies for winter and summer seasons.
- Special climate summaries, explanations, etc. (as appropriate).

*Most analyses contained in this Bulletin are based on preliminary, unchecked data received at the Climate Analysis Center via the Global Telecommunications System. Similar analyses based on final, checked data are likely to differ to some extent from those presented here.*

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# GLOBAL CLIMATE HIGHLIGHTS

## MAJOR CLIMATIC EVENTS AND ANOMALIES AS OF AUGUST 19, 1989

### 1. Western Canada:

#### WARM SPELL PERSISTS

Unusual warmth prevailed over much of Alberta, British Columbia, the Yukon and Northwest Territories. In the past week, average temperatures were as much as 6°C above normal [3 weeks].

### 2. Caribbean Islands:

#### LEEWARD ISLANDS RECEIVE OVERDUE RAINS

Antigua and Barbuda received between 50 and 75 mm of rain as the remnants of a tropical depression crossed the region. Otherwise, only light precipitation (generally less than 10 mm) was observed in Hispaniola, Puerto Rico, and the Windward Islands [9 weeks].

### 3. Northern Argentina, Uruguay, Southern Brazil:

#### UNUSUAL WINTER WARMTH

Abnormally mild weather has developed over the region recently. Maximum temperatures approached 34°C in northern Argentina while temperatures averaged 8°C above normal in extreme southern Brazil [2 weeks].

### 4. United Kingdom:

#### SHORT-TERM MOISTURE CONDITIONS IMPROVE

Overall precipitation in southern parts of the United Kingdom varied between 10 and 20 mm. Although a few locations received greater than 30 mm, pockets of dryness remained [Ending at 7 weeks].

### 5. Europe:

#### WARM WEATHER DOMINATES THE CONTINENT

The unusual warmth that was restricted to western Europe in previous weeks spread across much of the rest of the continent. The greatest positive departures were noted in eastern Europe where values approached +6°C [5 weeks].

### 6. Bulgaria, Romania, Moldavian and Ukrainian S.S.R.:

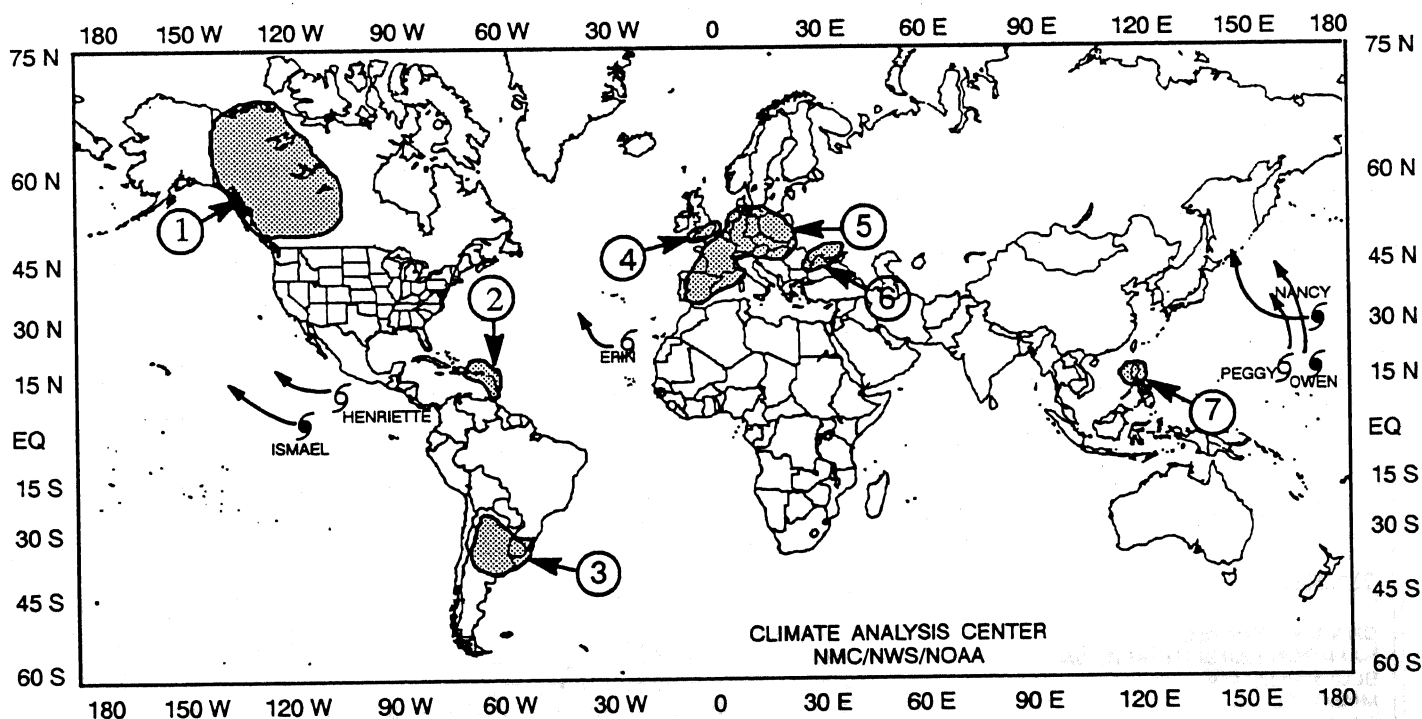
#### ABNORMAL DRYNESS DEVELOPS

During the past week, a large majority of the area was dry as only a few stations reported rainfall in excess of 10 mm. A number of locations have received less than 50% of normal precipitation since July 1 [7 weeks].

### 7. The Philippines:

#### EXCESSIVE RAINFALL CONTINUES

As much as 283 mm of rain fell on the northern Philippine island of Luzon, continuing the trend of torrential precipitation that has prevailed in recent weeks. Urban flooding and rural destruction from landslides were reported in the aftermath [Episodic Event].



#### EXPLANATION

TEXT: Approximate duration of anomalies is in brackets. Precipitation amounts and temperature departures are this week's values.

MAP: Approximate locations of major anomalies and episodic events are shown. See other maps in this Bulletin for current two week temperature anomalies, four week precipitation anomalies, long-term anomalies, and other details.

# UNITED STATES WEEKLY CLIMATE HIGHLIGHTS

FOR THE WEEK OF AUGUST 13 THROUGH AUGUST 19, 1989.

Much of the eastern three-quarters of the nation received some rainfall last week as a couple of slow-moving cold fronts, several upper-air disturbances, and moist, unstable air produced numerous showers and thunderstorms. Locally heavy downpours from nearly-stationary thunderstorms caused severe flooding in portions of central Oklahoma, the Delmarva Peninsula, and the Virginia Tidewater area. Between 6 and 12 inches of rain deluged several locations in these regions as most of the precipitation fell in a short time span. For example, Williamsburg, VA recorded 10.78 inches of rain in just four hours on Friday while parts of southeastern Delaware accumulated nearly 8 inches in three hours early Saturday morning. In sharp contrast to the sweltering heat in the Plains, Midwest, and mid-Atlantic approximately one year ago, unseasonably cool air continued for the second consecutive week across most of the eastern half of the country. During the first part of the week, a stationary front along the Atlantic Coast, in combination with a disturbance in the upper atmosphere over the northeastern Gulf of Mexico, generated abundant showers and thunderstorms from Florida northward to Maine. Farther west, two upper-air disturbances and a weak cold front triggered strong thunderstorms in the northern and central Great Plains and upper Mississippi Valley. By mid-week, the northern section of the cold front had progressed eastward to western New England, but the southern half had stalled across the central Great Plains and middle Mississippi Valley. Severe weather developed ahead of the front in New York and Pennsylvania, while unstable air produced strong thunderstorms in the central Rockies and Plains. Elsewhere, heavy showers and thunderstorms soaked portions of southern Florida and the lower Mississippi Valley. Towards the week's end, the cold front became stationary over the Tennessee Valley and the mid-Atlantic. Waves of low pressure formed along the front, generating intense and slow-moving thunderstorms. In addition to the aforementioned locations that experienced copious rainfall, upslope flow from the east produced locally heavy rains over

portions of the Virginia and West Virginia mountains. In the northern Plains, scattered thunderstorms preceding another cold front brought welcome rains to areas with long-term dryness, namely the eastern Dakotas and northern Nebraska.

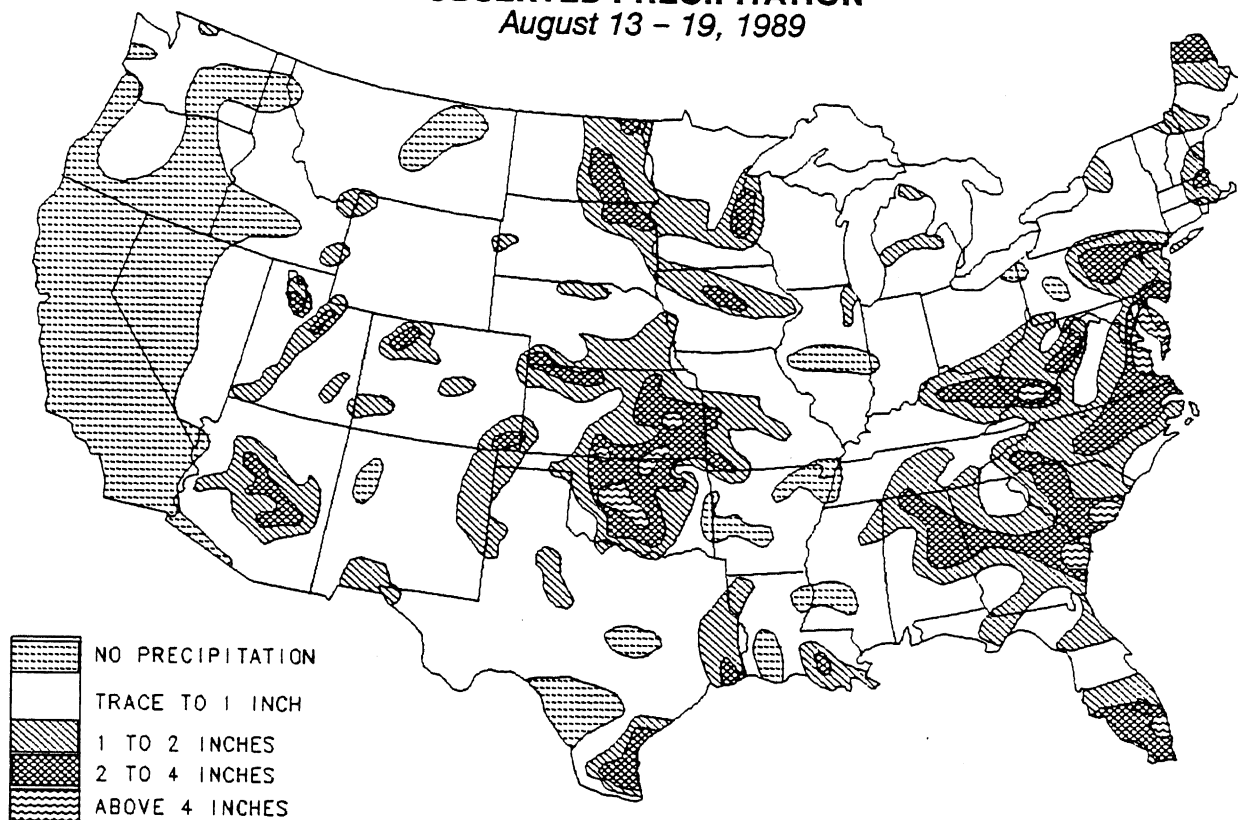
According to the River Forecast Centers, the largest weekly rainfall amounts occurred across central Oklahoma and eastern Kansas (see front cover), in most of the central and southern Appalachians and the southern Atlantic states, from coastal Virginia northward to Cape Cod, in southern Florida, and central Arizona (see Table 1). Locally heavy showers and thunderstorms were reported in parts of the northern Great Plains, from northern Wisconsin southwestward to central Iowa, along sections of the western Gulf, and in the southern Ohio Valley. Little or no rain fell on the Far West and in scattered sections of the southern Great Plains, the lower Mississippi and northern Ohio Valleys, and the eastern Great Lakes, while the remainder of the U.S. received light to moderate precipitation. Much of Alaska and Hawaii generally experienced below normal weekly precipitation.

Very few areas of the contiguous United States observed above normal temperatures as cooler air prevailed over the northwestern quarter and the eastern two-thirds of the nation last week. The greatest positive departures (between +3°F and +5°F) were limited to the desert Southwest, northern New England, and across most of southern Alaska (see Table 2). Near to slightly above normal temperatures were found along the Pacific Coast, in the northern Great Plains, southern Florida, and Hawaii. In contrast, subnormal weekly temperatures prevailed throughout the rest of the lower 48 states. A pair of cool Canadian high pressure centers, in addition to persistent cloudiness and frequent rainfall, kept temperatures below normal across much of the eastern half of the nation while cooler weather returned to the Pacific Northwest and the northern Rockies. Temperatures averaged between 5°F and 8°F below normal in the central Great Plains and lower Missouri Valley (see Table 3).

TABLE 1. Selected stations with 3.00 or more inches of precipitation for the week.

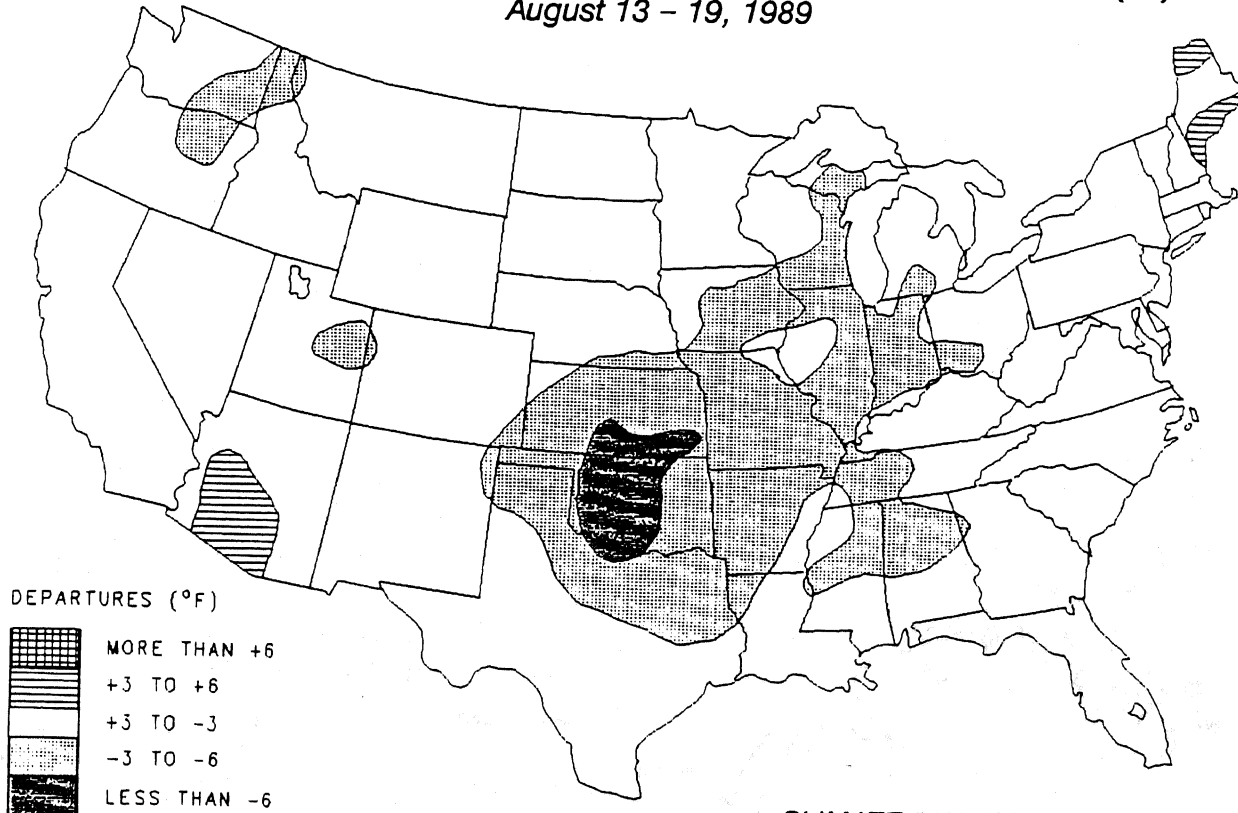
	TOTAL (INCHES)	STATION	TOTAL (INCHES)
CHARLESTON, SC	5.66	FORT MYERS, FL	3.59
HAMPTON/LANGLEY AFB, VA	4.64	ENID/VANCE AFB, OK	3.47
BLUEFIELD, WV	4.60	WARNER-ROBINS AFB, GA	3.44
MIAMI, FL	4.47	FAYETTEVILLE/FT BRAGG NDB, NC	3.37
SAVANNAH/HUNTER AFB, GA	4.33	ABERDEEN, SD	3.25
OKLAHOMA CITY/TINKER AFB, OK	3.91	MILLVILLE, NJ	3.23
BRUNSWICK, GA	3.85	SALISBURY, MD	3.20
HOMESTEAD AFB, FL	3.83	LIMESTONE/LORING AFB, ME	3.12
OKLAHOMA CITY, OK	3.66	ANNISTON, AL	3.11
NORFOLK, VA	3.60		

# **OBSERVED PRECIPITATION** August 13 - 19, 1989



CLIMATE ANALYSIS CENTER / NOAA

# **DEPARTURE OF AVERAGE TEMPERATURE FROM NORMAL (°F)** August 13 - 19, 1989



CLIMATE ANALYSIS CENTER / NOAA

**TABLE 2. Selected stations with temperatures averaging 4.0°F or more ABOVE normal for the week.**

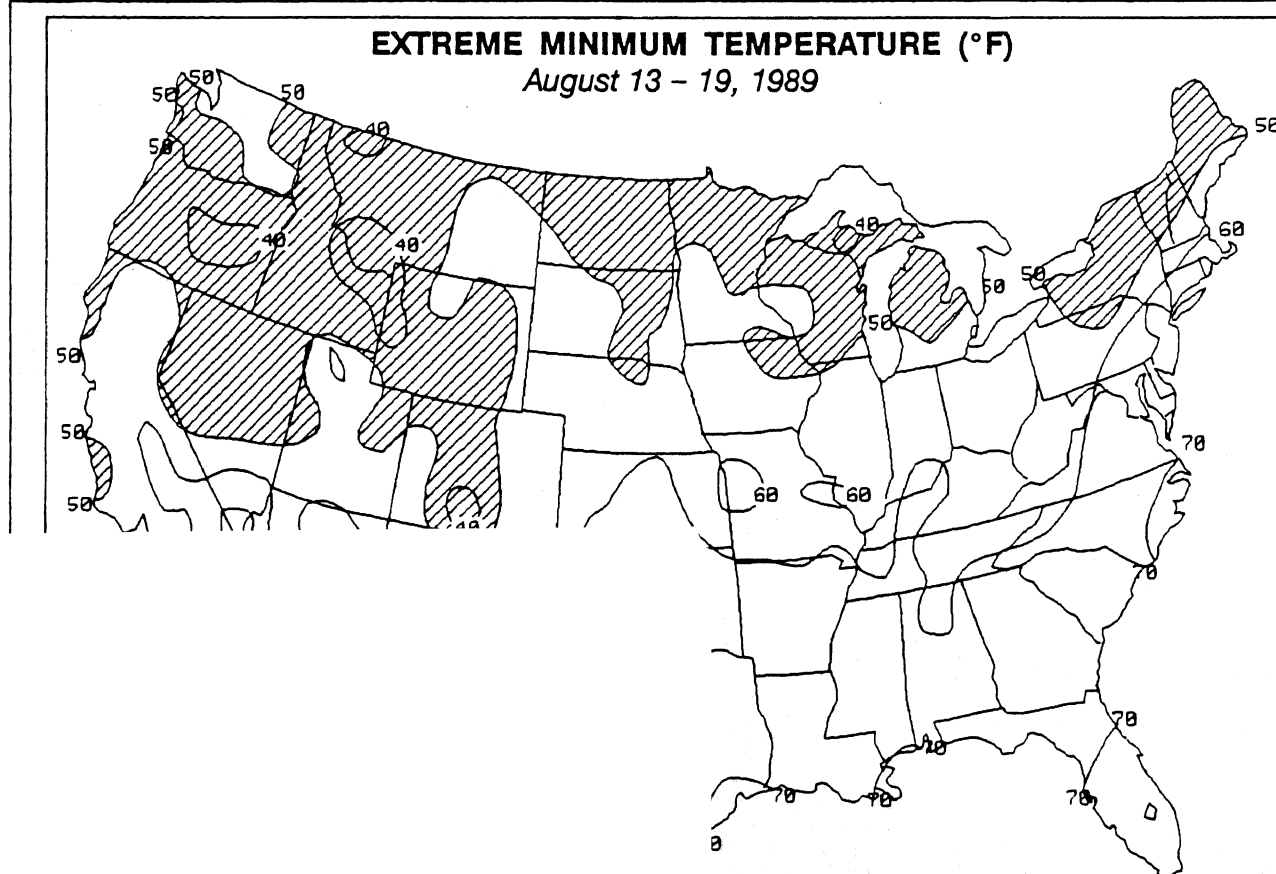
<u>STATION</u>	<u>DEPARTURE</u> (°F)	<u>AVERAGE</u> (°F)	<u>STATION</u>	<u>DEPARTURE</u> (°F)	<u>AVERAGE</u> (°F)
GULKANA, AK	+5.1	58.9	RUMFORD, ME	+4.4	69.5
GLENDALE/LUKE AFB, AZ	+5.0	93.4	CARIBOU, ME	+4.2	66.9
TALKEETNA, AK	+5.0	60.3	HOMER, AK	+4.2	57.1
ILIAMNA, AK	+5.0	59.2	ANCHORAGE, AK	+4.1	60.4
KING SALMON, AK	+4.9	59.1	NORTHWAY, AK	+4.1	58.1
PHOENIX, AZ	+4.7	94.8	KENAI, AK	+4.1	57.9
TUCSON, AZ	+4.6	88.7	BARROW, AK	+4.1	42.3
JUNEAU, AK	+4.6	59.5	COLD BAY, AK	+4.0	55.5
VICTORVILLE/GEORGE AFB, CA	+4.4	81.9			

**TABLE 3. Selected stations with temperatures averaging 5.0°F or more BELOW normal for the week.**

<u>STATION</u>	<u>DEPARTURE</u> (°F)	<u>AVERAGE</u> (°F)	<u>STATION</u>	<u>DEPARTURE</u> (°F)	<u>AVERAGE</u> (°F)
ENID/VANCE AFB, OK	-8.4	74.1	RUSSELL, KS	-5.8	72.8
OKLAHOMA CITY, OK	-7.3	74.1	BELLEVILLE/SCOTT AFB, IL	-5.7	71.7
FT. SILL/HENRY POST AAF, OK	-7.3	76.1	SPOKANE, WA	-5.6	62.7
WICHITA, KS	-6.4	73.7	JOPLIN, MO	-5.6	73.1
HOBART, OK	-6.4	75.9	COLUMBIA, MO	-5.5	71.4
WICHITA FALLS, TX	-6.4	78.2	SPRINGFIELD, MO	-5.3	71.8
CHANUTE, KS	-6.0	72.8	MCALESTER, OK	-5.2	76.8
GAGE, OK	-5.9	74.5	TULSA, OK	-5.1	76.8
DODGE CITY, KS	-5.8	72.8	KANSAS CITY/INTL., MO	-5.0	73.5

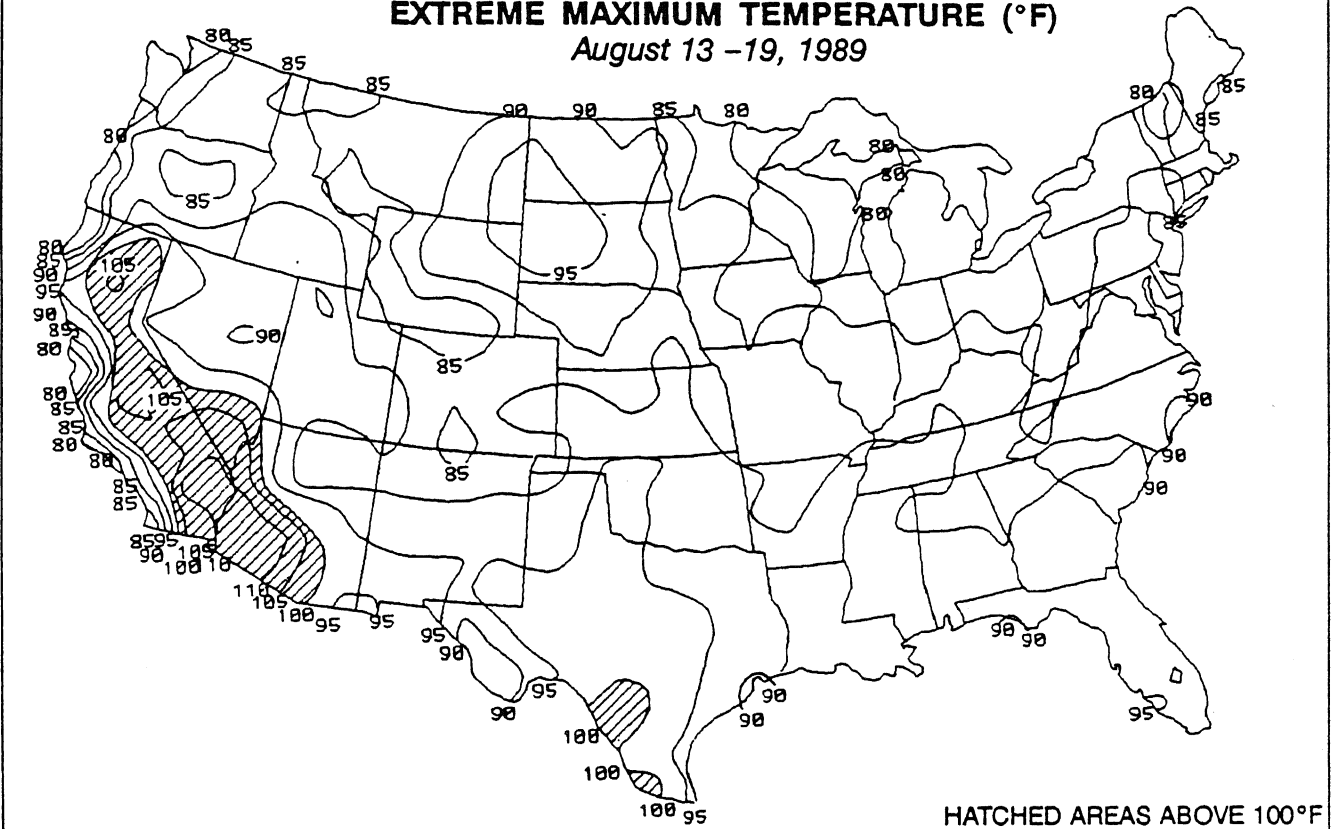
**EXTREME MINIMUM TEMPERATURE (°F)**

*August 13 - 19, 1989*



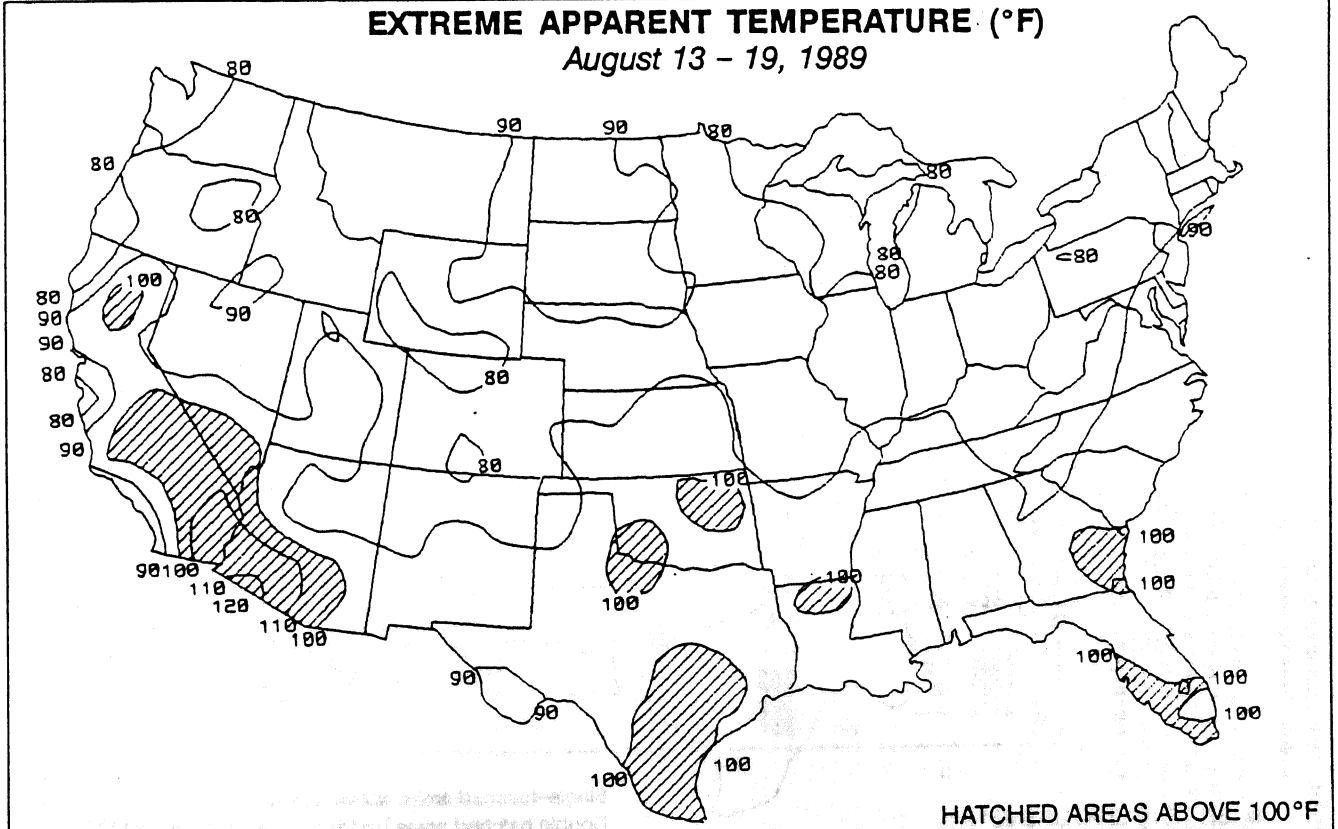
SHADED AREAS BELOW 50°F

# **EXTREME MAXIMUM TEMPERATURE (°F)** *August 13 - 19, 1989*

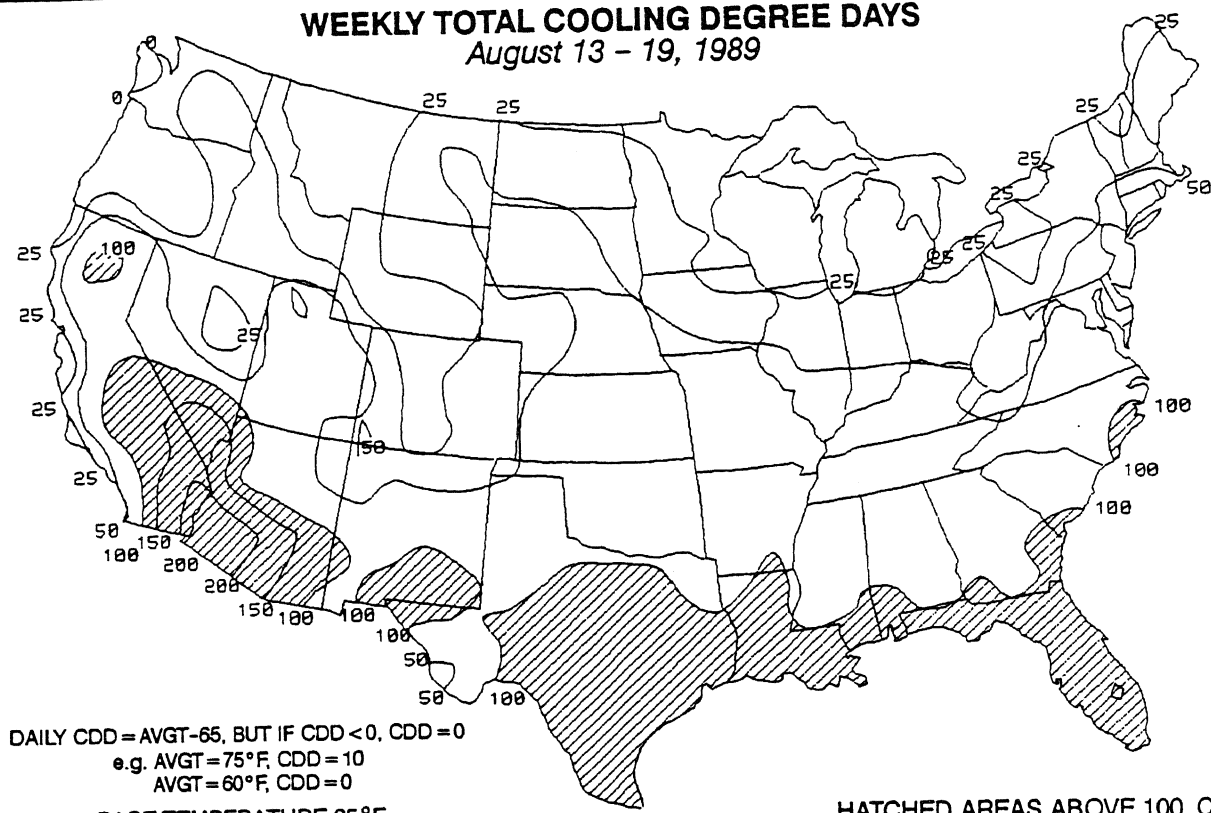


Unseasonably cool weather limited triple-digit temperatures to the desert Southwest and interior California. Highs failed to reach 90°F in the northwestern and northeastern quarters of the nation (top). Relatively cool and dry air kept apparent temperatures tolerable across the northern half of the country while heat and humidity produced dangerous apparent temperatures in the desert Southwest (bottom).

# **EXTREME APPARENT TEMPERATURE (°F)** *August 13 - 19, 1989*

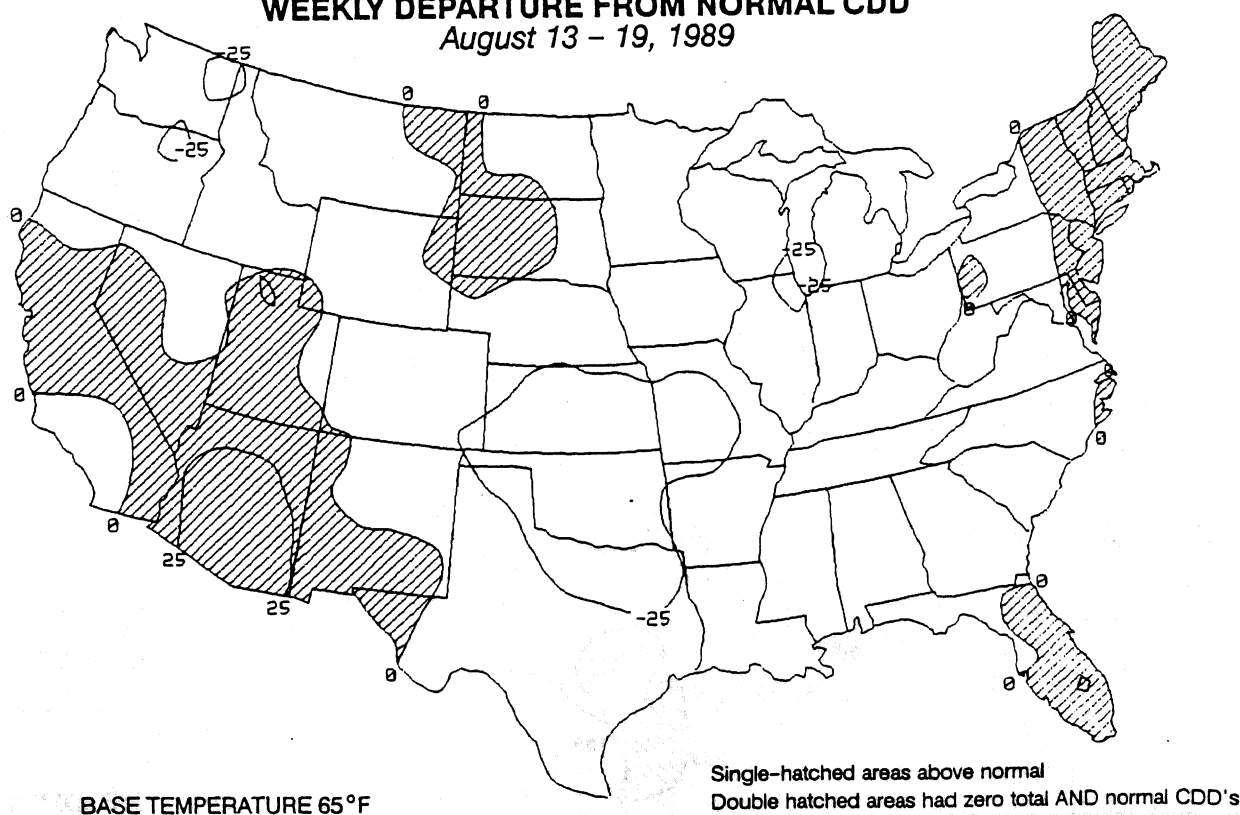


# **WEEKLY TOTAL COOLING DEGREE DAYS** August 13 - 19, 1989



The weekly total CDD's exceeded 100 in the desert Southwest and along the Gulf Coast from Texas to Florida (top). New England, Florida, the northern Plains, and the Southwest, with the exception of Southwestern California, experienced excess air-conditioning demand (bottom).

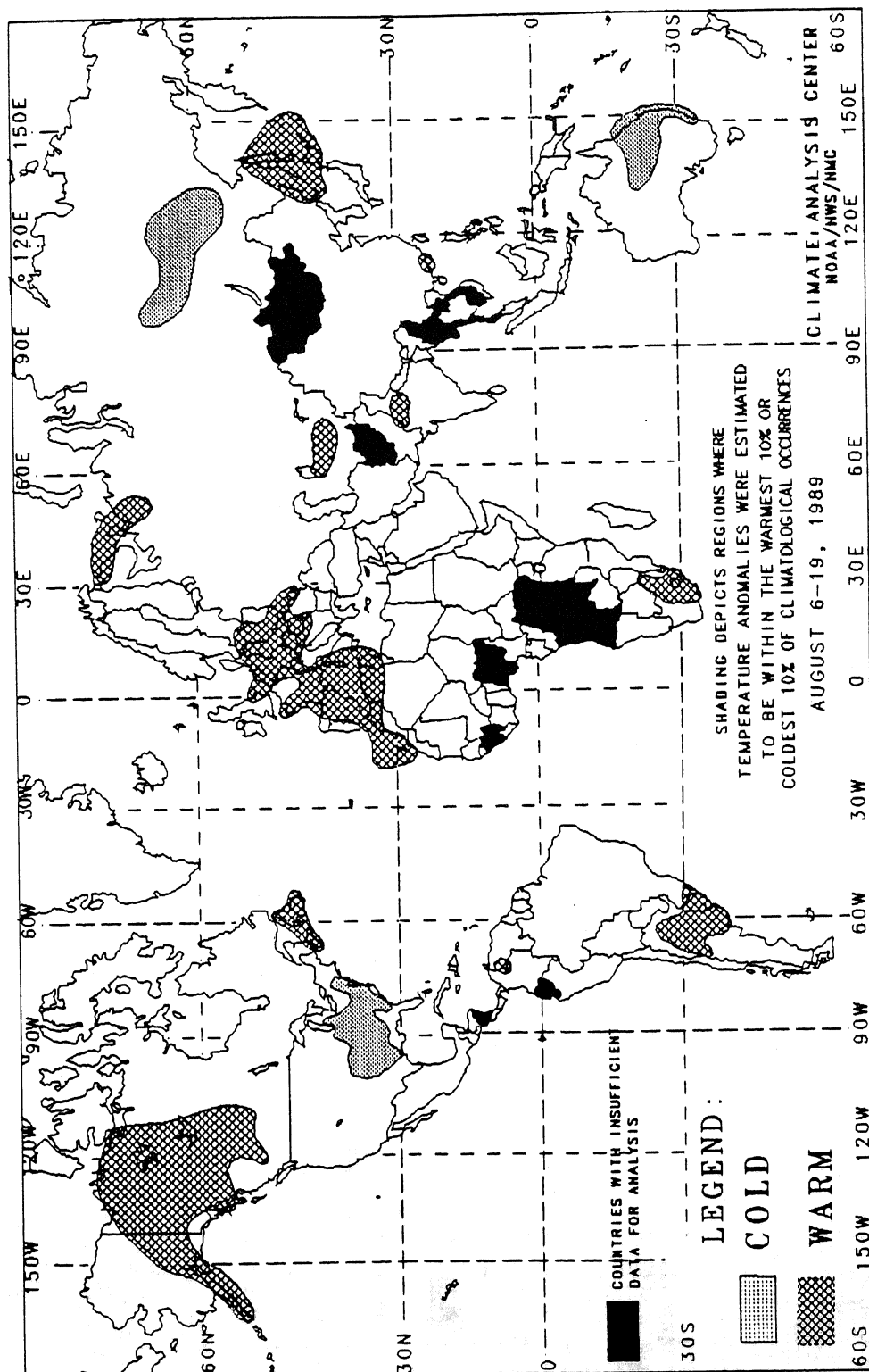
# **WEEKLY DEPARTURE FROM NORMAL CDD** August 13 - 19, 1989





# GLOBAL TEMPERATURE ANOMALIES

2 WEEKS



The anomalies on this chart are based on approximately 2500 observing stations for which at least 13 days of temperature observations were received from synoptic reports. Many stations do not operate on a twenty-four hour basis so many night time observations are not taken. As a result of these missing observations the estimated minimum temperature may have a warm bias. This in turn may have resulted in an overestimation of the extent of some warm anomalies.

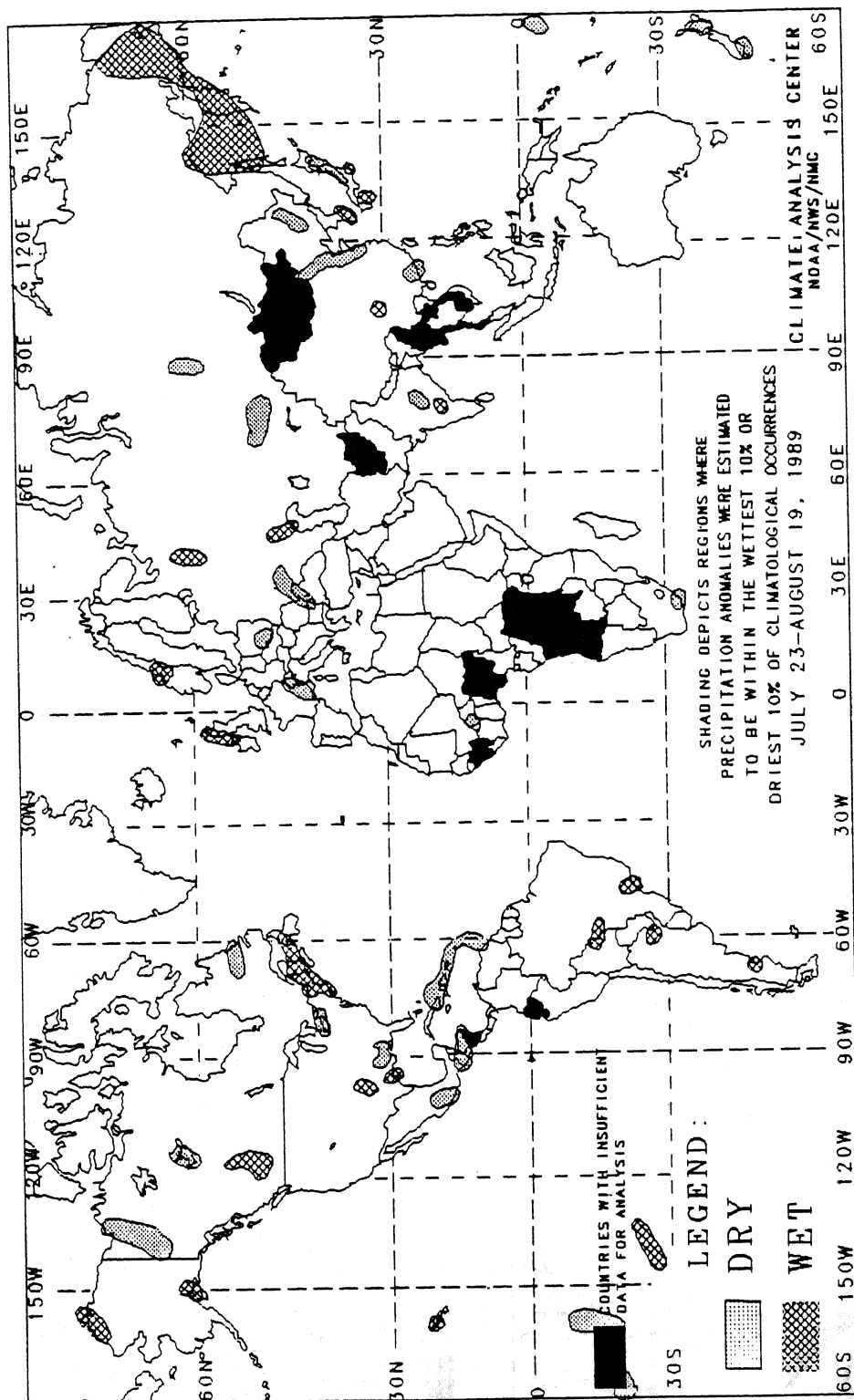
Temperature anomalies are not depicted unless the magnitude of temperature departures from normal exceeds 1.5°C.

In some regions, insufficient data exist to determine the magnitude of anomalies. These regions are located in parts of tropical Africa, southwestern Asia, interior equatorial South America, and along the Arctic Coast. Either current data are too sparse or incomplete for analysis, or historical data are insufficient for determining percentiles, or both. No attempt has been made to estimate the magnitude of anomalies in such regions.

This chart shows general areas of two week temperature anomalies. Caution must be used in relating it to local conditions, especially in mountainous regions.

# GLOBAL PRECIPITATION ANOMALIES

4 WEEKS



The anomalies on this chart are based on approximately 2500 observing stations for which at least 27 days of precipitation observations (including zero amounts) were received or estimated from synoptic reports. As a result of both missing observations and the use of estimates from synoptic reports (which are conservative), a dry bias in the total precipitation amount may exist for some stations used in this analysis. This in turn may have resulted in an overestimation of the extent of some dry anomalies.

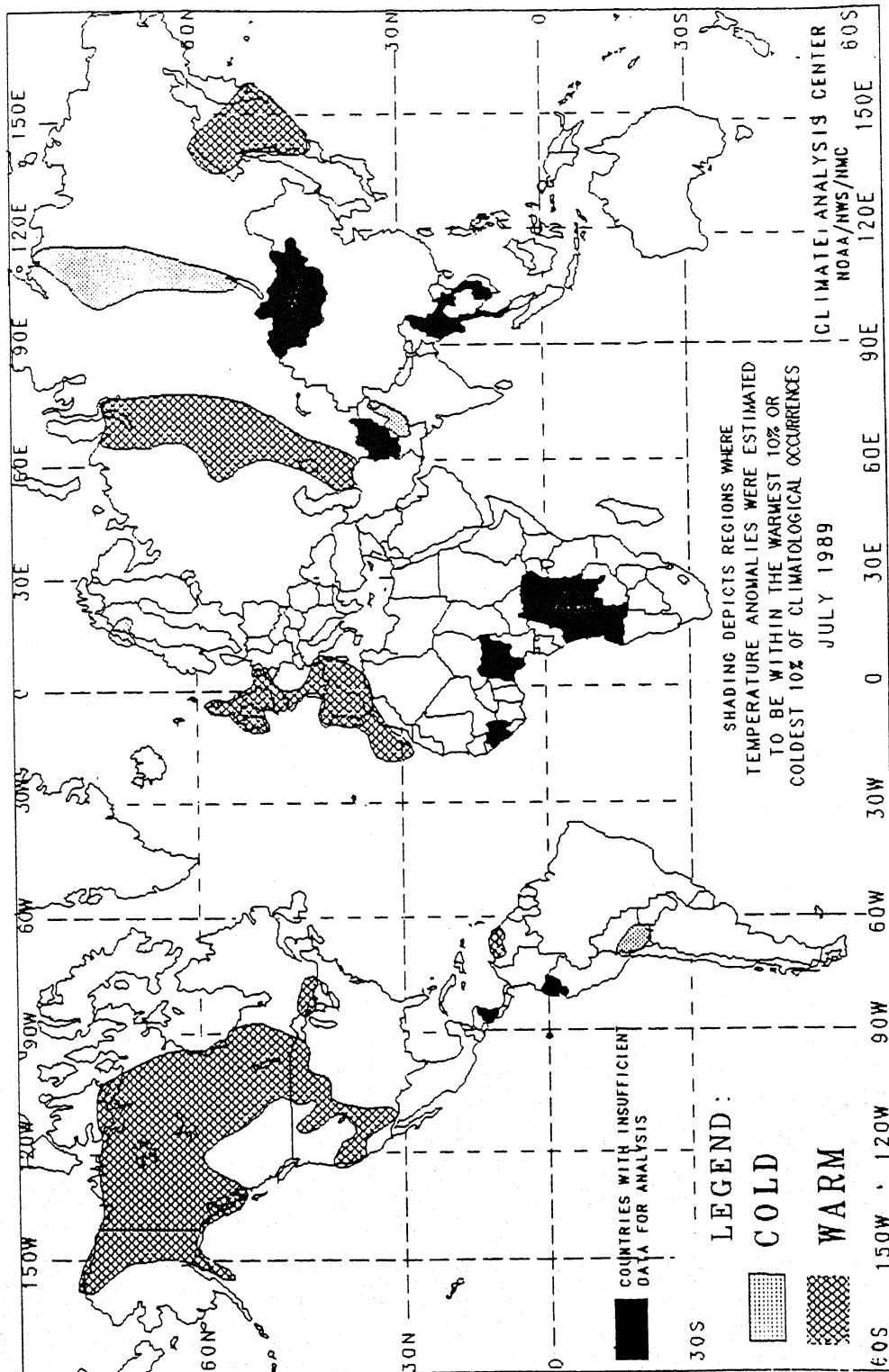
In climatologically arid regions where normal precipitation for the four week period is less than 20 mm, dry anomalies are not depicted. Additionally, wet anomalies for such arid regions are not depicted unless the total four week precipitation exceeds 50 mm.

In some regions, insufficient data exist to determine the magnitude of anomalies. These regions are located in parts of tropical Africa, southwestern Asia, interior equatorial South America, and along the Arctic Coast. Either current data are too sparse or incomplete for analysis, or historical data are insufficient for determining percentiles, or both. No attempt has been made to estimate the magnitude of anomalies in such regions.

The chart shows general areas of four week precipitation anomalies. Caution must be used in relating it to local conditions, especially in mountainous regions.

# GLOBAL TEMPERATURE ANOMALIES

1 MONTH



The anomalies on this chart are based on approximately 2500 observing stations for which at least 26 days of temperature observations were received from synoptic reports. Many stations do not operate on a twenty-four hour basis so many night time observations are not taken. As a result of these missing observations the estimated minimum temperature may have a warm bias. This in turn may have resulted in an overestimation of the extent of some warm anomalies.

Temperature anomalies are not depicted unless the magnitude of temperature departures from normal exceeds 1.5°C.

In some regions, insufficient data exist to determine the magnitude of anomalies. These regions are located in parts of tropical Africa, southwestern Asia, interior equatorial South America, and along the Arctic Coast. Either current data are too sparse or incomplete for analysis, or historical data are insufficient for determining percentiles, or both. No attempt has been made to estimate the magnitude of anomalies in such regions.

This chart shows general areas of one month temperature anomalies. Caution must be used in relating it to local conditions, especially in mountainous regions.

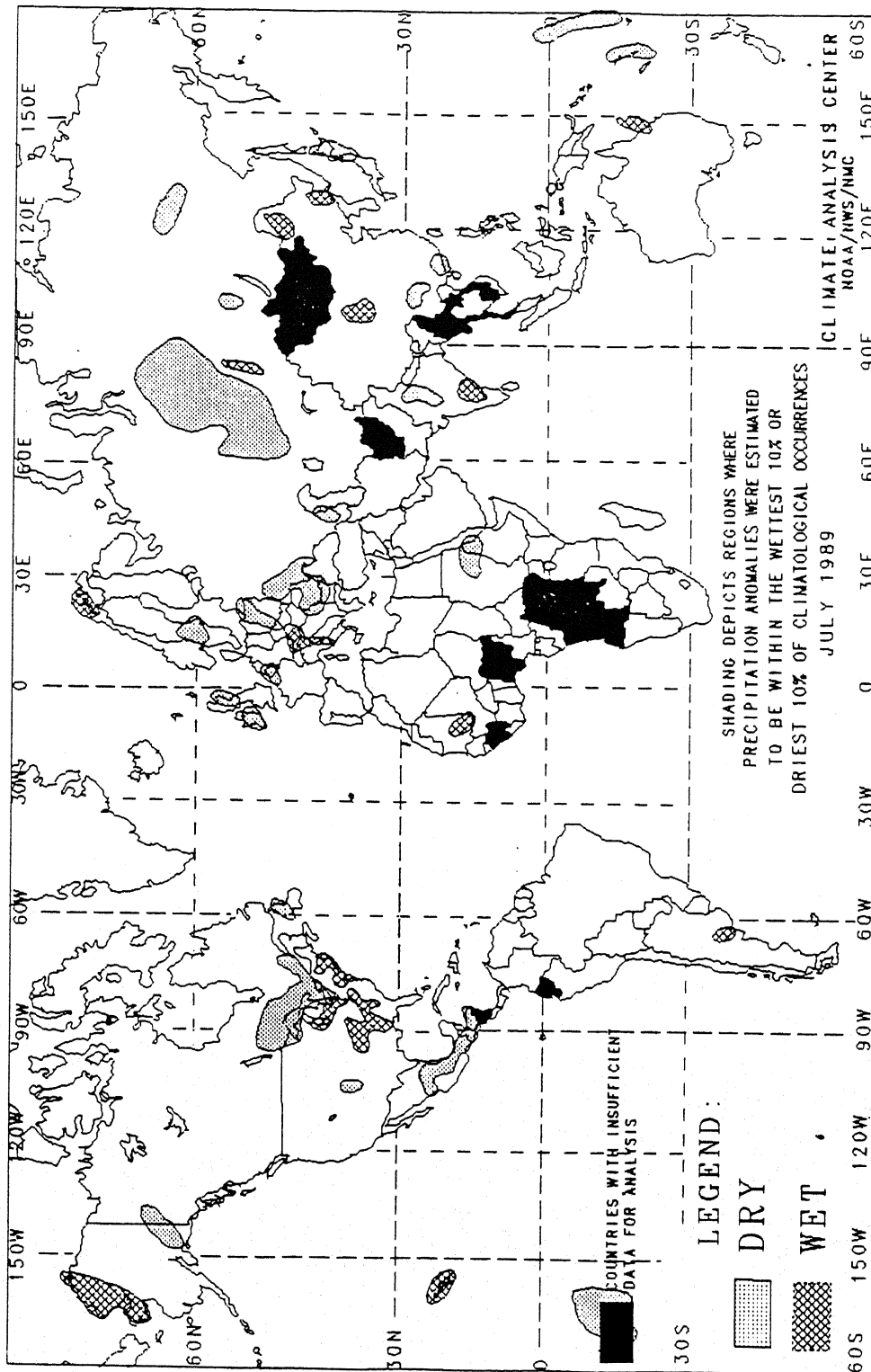
# PRINCIPAL TEMPERATURE ANOMALIES

JULY 1989

REGIONS AFFECTED	TEMPERATURE AVERAGE (°C)	DEPARTURE FROM NORMAL (°C)	COMMENTS
<b>NORTH AMERICA</b>			
Eastern Alaska, Western and Central Canada, and Western United States	+8 to +36	+2 to +4	WARM - 2 to 10 weeks
Southern Ontario	+18 to +22	Around +2	Very warm early and late in July
<b>SOUTH AMERICA AND EASTERN PACIFIC</b>			
Northern Venezuela	+26 to +29	+2 to +3	WARM - 2 to 4 weeks
Southern Bolivia	+2 to +16	-2 to -4	COLD - 4 to 7 weeks
<b>EUROPE AND THE MIDDLE EAST</b>			
Central Norway and Northwestern Sweden	+9 to +12	-2 to -3	Very cold first half of July
Western Europe	+13 to +30	+2 to +3	WARM - 2 to 8 weeks
<b>AFRICA</b>			
Morocco and Algeria	+22 to +30	+2 to +6	WARM - 2 to 4 weeks
<b>ASIA</b>			
Western Siberia	+10 to +33	+2 to +6	WARM - 4 to 14 weeks
Central Siberia	+7 to +16	-2 to -4	COLD - 4 to 10 weeks
Eastern Siberia	+12 to +20	+2 to +3	WARM - 2 to 7 weeks
Pakistan and Adjacent Parts of India	+22 to +33	-2 to -4	COLD - 2 to 4 weeks
<b>AUSTRALIA AND WESTERN PACIFIC</b>			
Near Seasonal Temperatures Generally Prevailed			

# GLOBAL PRECIPITATION ANOMALIES

1 MONTH



The anomalies on this chart are based on approximately 2500 observing stations for which at least 27 days of precipitation observations (including zero amounts) were received or estimated from synoptic reports. As a result of both missing observations and the use of estimates from synoptic reports (which are conservative), a dry bias in the total precipitation amount may exist for some stations used in this analysis. This in turn may have resulted in an overestimation of the extent of some dry anomalies.

In climatologically arid regions where normal precipitation for the one month period is less than 20 mm, dry anomalies are not depicted. Additionally, wet anomalies for such arid regions are not depicted unless the total one month precipitation exceeds 50 mm.

In some regions, insufficient data exist to determine the magnitude of anomalies. These regions are located in parts of tropical Africa, southwestern Asia, interior equatorial South America, and along the Arctic Coast. Either current data are too sparse or incomplete for analysis, or historical data are insufficient for determining percentiles, or both. No attempt has been made to estimate the magnitude of anomalies in such regions.

The chart shows general areas of one month precipitation anomalies. Caution must be used in relating it to local conditions, especially in mountainous regions.

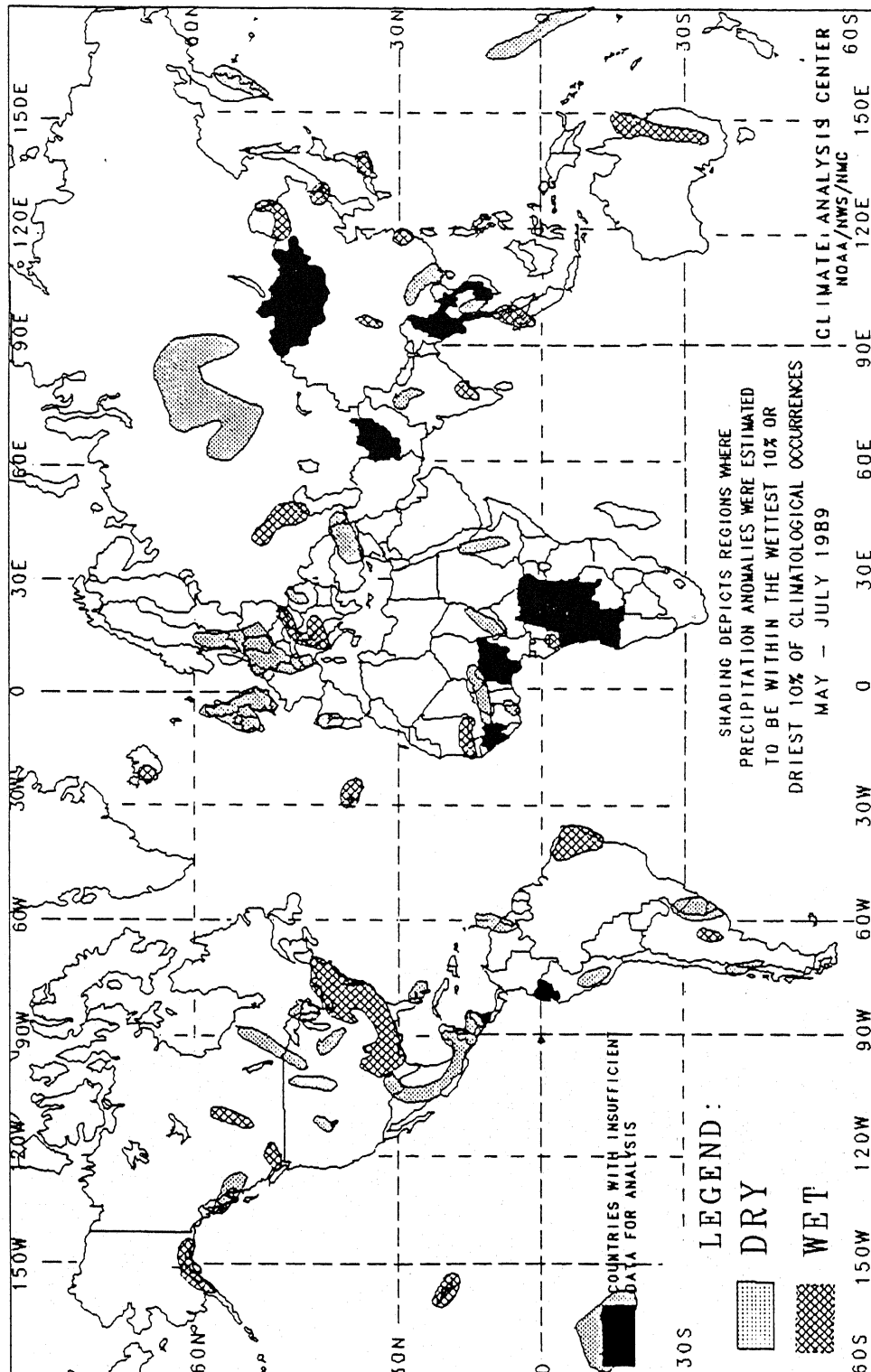
# PRINCIPAL PRECIPITATION ANOMALIES

JULY 1989

REGIONS AFFECTED	PRECIPITATION TOTAL (MM)	PERCENT OF NORMAL	COMMENTS
<b>NORTH AMERICA</b>			
Northwestern Alaska	81 to 118	171 to 380	WET - 5 to 10 weeks
Southeastern Alaska and Adjacent Parts of Canada	3 to 16	5 to 34	DRY - 5 to 7 weeks
Great Lakes Region	2 to 71	2 to 62	DRY - 4 to 10 weeks
Wisconsin, Illinois, Indiana, and Ohio	150 to 199	162 to 281	Heavy precipitation second half of July
Middle Atlantic Coast	129 to 256	151 to 294	WET - 4 to 6 weeks
Newfoundland	21 to 92	26 to 76	DRY - 7 weeks
Southeastern Colorado	16 to 24	33 to 45	DRY - 5 weeks
South Central United States	136 to 281	129 to 226	WET - 2 to 14 weeks
Hawaiian Islands	59 to 582	265 to 440	Heavy precipitation second half of July
Mexico and Honduras	14 to 143	8 to 55	DRY - 4 to 20 weeks
<b>SOUTH AMERICA AND EASTERN PACIFIC</b>			
Cook Islands	6 to 31	7 to 20	DRY - 7 to 14 weeks
East Central Argentina	48 to 80	276 to 354	Heavy precipitation second half of July
<b>EUROPE AND THE MIDDLE EAST</b>			
Northern Norway	68 to 131	171 to 246	WET - 5 weeks
Sweden	9 to 47	13 to 58	DRY - 4 to 9 weeks
Ireland	6 to 38	11 to 42	DRY - 5 to 7 weeks
Scotland	9 to 45	14 to 42	DRY - 5 weeks
Belgium and Northern France	16 to 36	15 to 58	DRY - 5 weeks
Poland and Czechoslovakia	15 to 66	20 to 58	DRY - 5 weeks
Italy and Austria	104 to 250	144 to 813	Heavy precipitation first half of July
Yugoslavia, Bulgaria, Romania, and Ukrainian S.S.R.	0 to 90	0 to 68	DRY - 5 to 10 weeks
Georgian S.S.R.	3 to 25	8 to 38	DRY - 6 weeks
<b>AFRICA</b>			
Southeastern Mauritania and Western Mali	77 to 195	154 to 384	WET - 4 to 9 weeks
East Central Sudan and Northern Ethiopia	0 to 35	0 to 22	DRY - 10 weeks
<b>ASIA</b>			
Western Siberia and Northern Kazakh S.S.R.	2 to 32	7 to 49	DRY - 6 to 14 weeks
Southwestern Siberia	116 to 154	190 to 203	WET - 4 weeks
South Central Siberia	17 to 65	26 to 63	DRY - 4 weeks
Central Siberia	7 to 10	16 to 23	DRY - 5 to 6 weeks
Northern Manchuria	133 to 234	122 to 203	Heavy precipitation second half of July
Northeastern China	153 to 294	162 to 273	WET - 2 to 10 weeks
North Central China	41 to 140	174 to 261	Heavy precipitation first half of July
South Central China	30 to 126	18 to 58	DRY - 4 to 7 weeks
Southeastern China	75 to 238	35 to 75	DRY - 6 weeks
Northern Japan	15 to 49	10 to 47	DRY - 5 to 10 weeks
Northern India	36 to 229	15 to 70	DRY - 7 to 10 weeks
Southern India	141 to 430	108 to 267	WET - 2 to 5 weeks
<b>AUSTRALIA AND WESTERN PACIFIC</b>			
Northeastern Australia	61 to 91	225 to 445	WET - 4 to 7 weeks
Vanuatu Island	7 to 118	5 to 50	DRY - 5 weeks
Kiribati Islands and Fiji Islands	19 to 104	12 to 49	DRY - 7 to 13 weeks

# GLOBAL PRECIPITATION ANOMALIES

3 MONTH



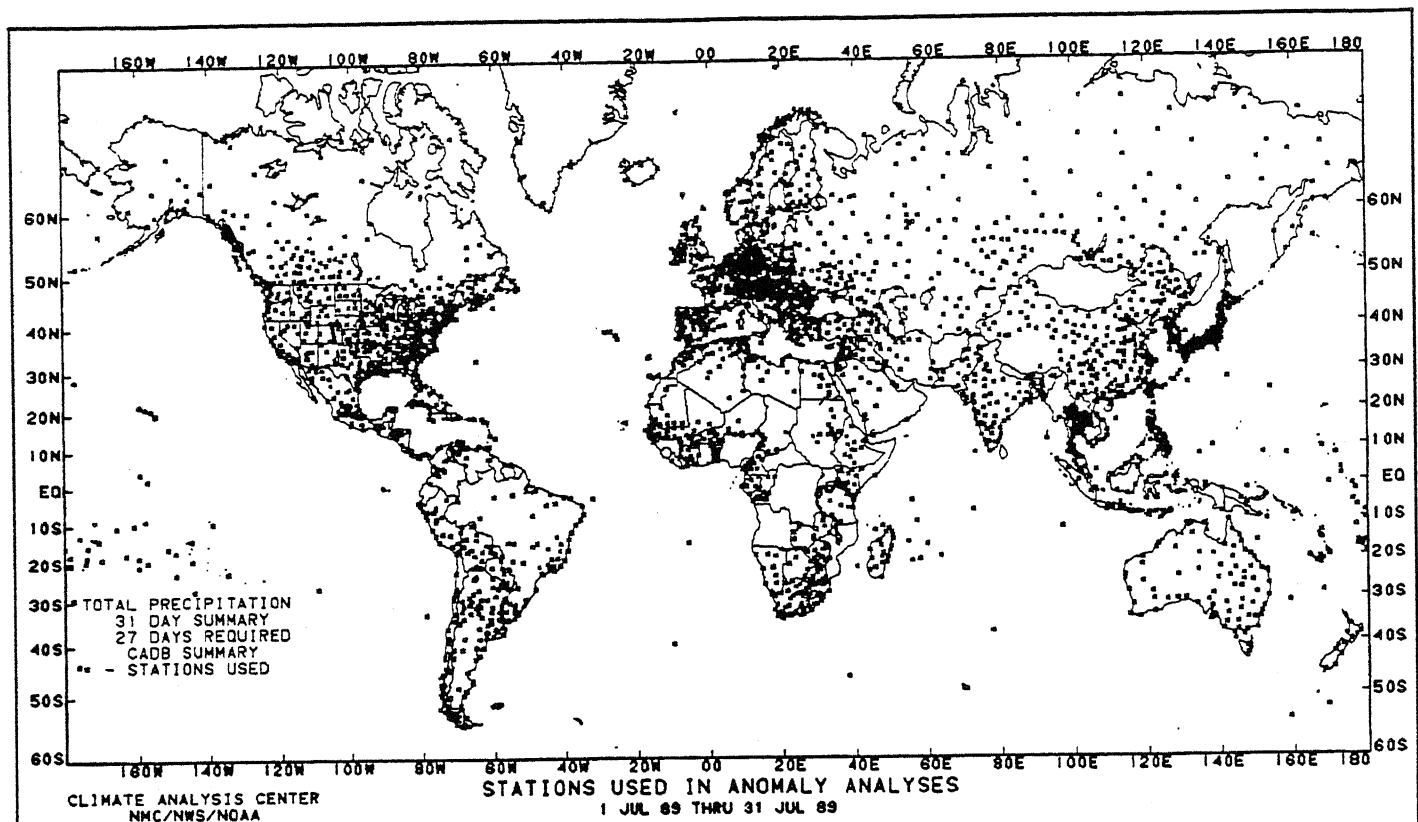
The anomalies on this chart are based on approximately 2500 observing stations for which at least 81 days of precipitation observations (including zero amounts) were received or estimated from synoptic reports. As a result of both missing observations and the use of estimates from synoptic reports (which are conservative), a dry bias in the total precipitation amount may exist for some stations used in this analysis. This in turn may have resulted in an overestimation of the extent of some dry anomalies.

In climatologically arid regions where normal precipitation for the three month period is less than 50 mm, dry anomalies are not depicted. Additionally, wet anomalies for such arid regions are not depicted unless the total three month precipitation exceeds 125 mm.

In some regions, insufficient data exist to determine the magnitude of anomalies. These regions are located in parts of tropical Africa, southwestern Asia, interior equatorial South America, and along the Arctic Coast. Either current data are too sparse or incomplete for analysis, or historical data are insufficient for determining percentiles, or both. No attempt has been made to estimate the magnitude of anomalies in such regions.

The chart shows general areas of three month precipitation anomalies. Caution must be used in relating it to local conditions, especially in mountainous regions.

# STATIONS USED IN THE MONTHLY ANOMALY ANALYSES ( JULY 1989)



Stations used in the anomaly analyses for total precipitation (top) and average temperatures (bottom) during July 1989. 27 (26) or more days were required for inclusion in the monthly total precipitation (average) temperature anomaly analyses. There were no data receipts for some countries in Africa, the Middle East, and Southeast Asia.

